

AMENDMENTS TO THE CLAIMS

1. (Currently Amended) An optical network analyzer for measuring an optical characteristic of an object to be measured, comprising:

a light source for generating a first optical signal;

a first demultiplexer for demultiplexing the first optical signal and for outputting a second optical signal and a third optical signal;

a first reference signal generating section for generating a first reference signal; and

a frequency converter for converting the frequency of the third optical signal based on the first reference signal;

a first multiplexer for multiplexing a first the second optical signal which has been transmitted through the object to be measured, and a second the third optical signal having a frequency different from the first second optical signal, and for outputting a third fourth optical signal;

a first photoelectrical converter for converting the third fourth optical signal into a first electric signal; and

a phase measurement block for comparing phases of the first electric signal and a the first reference signal;

~~a light source for generating a fourth optical signal;~~

~~a first demultiplexer for demultiplexing the fourth optical signal and for outputting the first optical signal and the second optical signal;~~

~~a first reference signal generating section for generating the first reference signal; and~~

~~a frequency converter for converting a frequency of the second optical signal based on the first reference signal.~~

2. (Cancelled)

3. (Currently Amended) The optical network analyzer as claimed in claim 21, further comprising:

a first divider for dividing a the frequency of the first electric signal; and

a second divider for dividing a the frequency of the first reference signal, wherein

said phase measurement block receives the first electric signal, of which the frequency is divided by said first divider, and the first reference signal, of which the frequency

is divided by said second divider, and compares the phases of the first electric signal and the first reference signal.

4. (Currently Amended) The optical network analyzer as claimed in claim 3, further comprising an amplitude measurement section for receiving the first electric signal converted by said first photoelectrical converter, and for measuring amplitude of the ~~first~~ second optical signal which has been transmitted through the object to be measured.
5. (Currently Amended) The optical network analyzer as claimed in claim 21, further comprising:
 - a first divider for dividing the frequency of the first electric signal; and
 - ~~a reference signal generating section for generating a reference signal,~~ wherein said first reference signal generating section generates the first reference signal and ~~the~~ a second reference signal based on the first reference signal, and
 - said phase measurement block receives the first electric signal, of which the frequency is divided by said first divider, and the second reference signal generated by said first reference signal generating section, and compares the phases of the first electric signal and the second reference signal.
6. (Currently Amended) The optical network analyzer as claimed in claim 3, further comprising:
 - a second reference signal generating section for generating a ~~second~~ third reference signal;
 - a first multiplier for converting a the frequency of the first electric signal based on the ~~second~~ third reference signal;
 - a first filter for passing a predetermined frequency component of the first electric signal of which the frequency is converted by said first multiplier;
 - a second multiplier for converting a the frequency of the first reference signal based on the ~~second~~ third reference signal; and
 - a second filter for passing a predetermined frequency component of the first reference signal, of which the frequency is converted by said second multiplier, for extracting the first reference signal, wherein

said first divider divides the frequency of the first electric signal which has passed through said first filter, and

said second divider divides the frequency of the first reference signal which has passed through said second filter.

7. (Currently Amended) The optical network analyzer as claimed in claim 1, further comprising:

a second multiplexer for multiplexing a ~~fourth~~ fifth optical signal reflected from the object to be measured and a ~~fifth~~ sixth optical signal having a frequency different from the ~~fourth~~ fifth optical signal, and for outputting a ~~sixth~~ seventh optical signal; and

a second photoelectrical converter for converting the ~~sixth~~ seventh optical signal into a second electric signal, wherein

said phase measurement block further compares phases of the second electric signal and the first reference signal.

8. (Currently Amended) The optical network analyzer as claimed in claim 7, further comprising:

~~a light source for generating a seventh optical signal;~~

a ~~first~~ second demultiplexer for demultiplexing the ~~seventh~~ third optical signal and for outputting the ~~first~~ sixth optical signal and an eighth optical signal;

a directional coupler, being provided between said first demultiplexer and the object to be measured, for allowing the ~~fourth~~ fifth optical signal, which has been reflected from the object to be measured by outputting the first optical signal to the object to be measured, to pass through said directional coupler;

~~a first reference signal generating section for generating a first reference signal;~~

~~a frequency converter for converting a frequency of the eighth optical signal based on the first reference signal; and~~

a second demultiplexer for demultiplexing the ~~eighth~~ the optical signal, of which the frequency is converted, to the ~~second~~ sixth optical signal and ~~the fifth~~ an eighth optical signal.

9. (Currently Amended) The optical network analyzer as claimed in claim 8, further comprising:
- a first divider for dividing a the frequency of the first electric signal;
 - a second divider for dividing a the frequency of the second electric signal; and
 - a third divider for dividing a the frequency of the first reference signal, wherein said phase measurement block receives the first electric signal, of which the frequency is divided by said first divider, the second electric signal, of which the frequency is divided by said second divider, and the first reference signal, of which the frequency is divided by said third divider, and compares phases of the first electric signal and the first reference signal, and phases of the second electric signal and the first reference signal.
10. (Currently Amended) The optical network analyzer as claimed in claim 9, further comprising an amplitude measurement section for receiving the first electric signal converted by said first photoelectrical converter and the second electric signal converted by said second photoelectrical converter, and for measuring amplitude of the ~~first~~ second optical signal which has been transmitted through the object to be measured and the ~~fourth~~ fifth optical signal reflected from the object to be measured.
11. (Currently Amended) The optical network analyzer as claimed in claim 7, further comprising:
- a first divider for dividing a the frequency of the first electric signal;
 - a second divider for dividing a the frequency of the second electric signal; and
 - ~~a reference signal generating section for generating a reference signal,~~ wherein said first reference signal generating section generates the first reference signal and ~~the~~ a second reference signal based on the first reference signal, and
- said phase measurement block receives the first electric signal, of which the frequency is divided by said first divider, the second electric signal, of which the frequency is divided by said second divider, and the second reference signal generated by said first reference signal generating section, and compares phases of the first electric signal and the second reference signal, and phases of the second electric signal and the second reference signal.

12. (Cancelled)

13. - 26. (Canceled)

27. (Cancelled)

28. (Cancelled)

29. (Cancelled)

30. (Cancelled)

31. (Cancelled)

32. (Cancelled)

33. (Currently Amended) The optical network analyzer as claimed in claim 27, further comprising:

said phase measurement block further compares phases of the first electric signal and the second electric signal.

34. (Currently Amended) The optical network analyzer as claimed in claim 33, further comprising:

~~a light source for generating an eighth optical signal;~~

~~a first demultiplexer for demultiplexing the eighth optical signal and for outputting a ninth optical signal and a tenth optical signal;~~

a second demultiplexer for demultiplexing the ninth third optical signal, of which the frequency is converted, and for outputting the first optical signal and the fifth optical signal; to the sixth optical signal and the an eighth optical signal;

~~a frequency converter for converting a frequency of the tenth optical signal based on the first reference signal; and~~

a third demultiplexer for demultiplexing the tenth third optical signal, of which the frequency is converted, to the second optical signal and the sixth optical signal, and for outputting a ninth optical signal and a tenth optical signal.

35. (Currently Amended) The optical network analyzer as claimed in claim 34, further comprising:
- a first divider for dividing a the frequency of the first electric signal; and
 - a second divider for dividing a the frequency of the second electric signal, wherein said phase measurement block receives the first electric signal, of which the frequency is divided by said first divider, and the second electric signal, of which the frequency is divided by said second divider, and compares phases of the first electric signal and the second electric signal.
36. (Currently Amended) The optical network analyzer as claimed in claim 35, further comprising an amplitude measurement section for receiving the first electric signal converted by said first photoelectrical converter and for measuring amplitude of the ~~first~~ second optical signal which has been transmitted through the object to be measured.
37. (Currently Amended) The optical network analyzer as claimed in claim 36, wherein said amplitude measurement section further receives the second electric signal converted by said second photoelectrical converter, and compares amplitude of the first ~~optical~~ electric signal and the ~~fifth optical~~ second electric signal.
38. (Currently Amended) The optical network analyzer as claimed in claim 33, further comprising:
- a directional coupler, being provided between said first demultiplexer and the object to be measured, for allowing the fifth optical signal, which has been reflected from the object to be measured by outputting the second optical signal to the object to be measured, and a eleventh optical signal, to pass through said directional coupler;
 - a second demultiplexer for demultiplexing the third optical signal, of which the frequency is converted, to the sixth optical signal, the eighth optical signal, and a twelfth optical signal;
 - a third multiplexer for multiplexing an eighth optical signal reflected from the object to be measured and a ninth optical signal having substantially the same frequency as the second optical signal, and for outputting a tenth optical signal; the eleventh optical signal and the twelfth optical signal; and

a third photoelectrical converter for converting the tenth optical signal into a third electric signal, wherein
said phase measurement block further compares phases of the third electric signal and the second electric signal.

39. (Cancelled)

40. (Currently Amended) The optical network analyzer as claimed in claim ~~39~~ 38, further comprising:

a first divider for dividing a the frequency of the first electric signal;
a second divider for dividing a the frequency of the second electric signal; and
a third divider for dividing a the frequency of the third electric signal, wherein
said phase measurement block receives the first electric signal, of which the frequency is divided by said first divider, the second electric signal, of which the frequency is divided by said second divider, and the third electric signal, of which the frequency is divided by said third divider, and compares phases of the first electric signal and the second electric signal, and phases of the second electric signal and the third electric signal.

41. (Currently Amended) The optical network analyzer as claimed in claim 40, further comprising an amplitude measurement section for receiving the first electric signal converted by said first photoelectrical converter and the ~~third~~ second electric signal converted by said ~~third~~ second photoelectrical converter, and for measuring amplitude of the first optical signal which has transmitted the object to be measured and the ~~eighth~~ fifth optical signal reflected from the object to be measured.

42. (Currently Amended) The optical network analyzer as claimed in claim 41, wherein said amplitude measurement section further receives the ~~second~~ third electric signal converted by said ~~second~~ third photoelectrical converter, and compares amplitude of the first ~~optical electrical~~ signal and the ~~fifth-optical~~ third electric signal, and amplitude of the ~~fifth-optical second electric~~ signal and the ~~eighth-optical~~ third electric signal.

43. (Currently Amended) The optical network analyzer as claimed in claim 33, further comprising:

~~a first light source for generating an eighth optical signal;~~
~~a first demultiplexer for demultiplexing the eighth optical signal and for outputting the first optical signal and the fifth optical signal;~~
a second light source for generating a ~~ninth~~ thirteenth optical signal; and
a second demultiplexer for demultiplexing the ~~ninth~~ thirteenth optical signal and for outputting ~~the second~~ a fourteenth optical signal and ~~the sixth~~ a fifteenth optical signal.

44. (Currently Amended) The optical network analyzer as claimed in claim 43, further comprising:

a first divider for dividing a the frequency of the first electric signal; and
a second divider for dividing a the frequency of the second electric signal, wherein said phase measurement block receives the first electric signal, of which the frequency is divided by said first divider, and the second electric signal, of which the frequency is divided by said second divider, and compares phases of the first electric signal and the second electric signal.

45. (Currently Amended) The optical network analyzer as claimed in claim 44, further comprising an amplitude measurement section for receiving the first electric signal converted by said first photoelectrical converter and for measuring amplitude of the ~~first~~ second optical signal which has been transmitted through the object to be measured.

46. (Currently Amended) The optical network analyzer as claimed in claim 45, wherein said amplitude measurement section further receives the second electric signal converted by said second photoelectrical converter, and compares amplitude of the first ~~optical~~ electric signal and the ~~fifth optical~~ second electric signal.